

REMARKS

Claims 8-24 are currently pending. Of these, claims 8 and 18 are independent. All claims stand rejected as being obvious over Nathan (U.S. Pat. No. 6,295,146) in view of Cleveland (U.S. Pat. App. Pub. No. 2003/0112821), or over Nathan in view of Cleveland and in further view of Egoshi (U.S. Pat. No. 6,163,526).

The claimed invention is directed to safely and efficiently restoring traffic in an optical network from a protection circuit to a working circuit following the failure and recovery of the working circuit. More particularly, the claimed invention employs a two-step recovery process to avoid switching back to the working circuit before that circuit has fully recovered. For example, consider a working circuit that connects two optical transport nodes in an optical network. After a failure of the working circuit connecting the two nodes, the network will try to recover the circuit. However, there can be situations where the working circuit has only partially recovered (e.g., the working circuit has recovered in one direction but not in the other direction). In such cases, switching back to the working circuit before it has fully recovered would result in further fault protection switching, thereby causing additional traffic interruption.

The claimed invention, therefore, provides a mechanism for checking that the working circuit has fully recovered prior to switching traffic back on to the working circuit. When a node A at one end of the working circuit detects that the working circuit has been recovered, it sends a RevertRequest message to a node B disposed at the other end of the working circuit. If a finite state machine at node B also indicates that the working circuit is recovered from its perspective, then node B sends a Revert message to node A causing node A to switch back to the working circuit. This extra signaling between the nodes A and B ensures that the working circuit is fully recovered before switching traffic back to the working circuit, and avoids unnecessary protection switching should the working circuit not have been fully recovered.

Claim 18 is directed to a method of activating and deactivating a pre-programmed secondary traffic path in a transmission network having a plurality of communicatively interconnected transport network elements. Each transport network element includes an agent to control the activation and deactivation of a primary traffic circuit and a secondary traffic circuit.

Claim 18 stands rejected under §103(a) as being obvious over Nathan in view of Cleveland. However, claim 18 recites, "sending an Activate message from a first transport network element to a second transport network element to activate a secondary traffic circuit that interconnects the first and second transport network elements." The Activate message is sent between the two transport network elements communicating via the traffic circuits. Neither reference, alone or in combination, teaches or suggests this limitation.

Nathan discloses a channel sharing mechanism for ring circuit protection, and provides a method for implementing protection switching from a main channel to a spare channel. Although Nathan discloses sending commands to activate the spare channel, those commands (which the Office Action equates to the claimed "Activate message") are not sent "from a first transport network element to a second transport network element," as claimed. Rather, first and second Optical Cross-Connect Switch (OCCS) controllers independently detect when a failure of a working channel occurs responsive to receiving a failure indication from a corresponding ring element. Each OCCS controller then sends a command, independently from the other OCCS controller, to corresponding first and second Optical Cross-Connect Switches. Each switch will then, upon receipt of its command, configure itself to utilize the spare channel. *Nathan*, col. 8, ll. 42-63.

Therefore, although Nathan discloses switching to a spare channel so that two ring elements can communicate over an activated spare channel, Nathan does not teach or suggest that the ring elements themselves activate the spare channel by sending "Activate messages"

as claimed. Cleveland also fails to teach or suggest this limitation, and the Office Action does not allege that it does.

Additionally, none of the cited references teaches or suggests, "sending a RevertRequest message from the first transport network element to the second transport network element to request deactivation of the secondary traffic circuit at the second transport element...[and]... sending a Revert message from the first transport network element to the second transport network element to indicate that the secondary traffic circuit has been deactivated at the first transport element responsive to receiving a RevertRequest message from the second transport network element." The Office Action indicates that only the reference to Cleveland discloses these limitations. However, scrutiny of Cleveland proves otherwise.

Cleveland discloses a wireless system in which packets that are dropped while communicating on a main channel are re-transmitted on a supplemental channel. Notably, there is no failure of the main channel that causes the supplemental channel to begin communicating traffic, as there is in the claimed invention. Once the replacement data packets have been received, the supplemental channel is switched off.

The Office Action cites paragraph [0086] on pages 7-8 of Cleveland, and equates the IS-2000 and the ESCAM messages disclosed in this paragraph to the claimed RevertRequest and Revert messages. However, the disclosed messages are not the claimed messages because each is transmitted and received by different network entities. According the cited passage, the IS-2000 messages are sent from a first base station (BS) to a second BS in the wireless network, and the ESCAM messages are then sent from the second BS to a mobile station (MS). In contrast, both of the claimed RevertRequest and Revert messages are communicated by a first transport network element to a second transport network element.

The cited references alone do not teach or suggest every limitation of claim 18. Therefore, their combination also fails to teach or suggest every limitation of claim 18. For at

least this reason, the cited references do not teach or suggest, alone or in combination, claim 18 or any of its dependent claims.

Additionally, however, there is no reason to modify Nathan according to Cleveland as the Office Action indicates. In fact, there are multiple reasons why one skilled in the art would not want to modify Nathan with Cleveland. Particularly, Nathan relates to optical systems. With optical switching, either the main channel is operating, or the protection channel is operating, but not both. If one skilled in the art wanted to modify the optical switching of Nathan to revert back to a working channel, that person would not look to the wireless system of Cleveland, which discloses a system in which both the main channel and the supplemental channel continue to operate in parallel.

Another reason is that Cleveland does not teach or suggest what Nathan is missing, and thus, neither reference provides an impetus to make the proffered combination. Nathan discusses protection switching in optical networks from a failed working channel to a spare channel. However, Nathan never mentions reverting back to the working channel after it once again becomes operational. Therefore, nothing in Nathan would ever lead one skilled in the art to consider switching back to the working channel after it becomes available. As for Cleveland, deactivating the supplemental channel does not cause the traffic to flow once again over the main channel because the supplemental channel carries only replacement packets. Cleveland does not teach or suggest the use of the supplemental channel as a protection circuit for all packets.

Finally, both references relate to different types of communications systems. Cleveland relates to mobile wireless systems. Such systems are not analogous to optical physical layer systems, such as those of the claimed invention, and no one skilled in the art would consider Cleveland when looking for ways to improve upon optical protection switching. The two technologies address very different problems in very different environments. For example,

wireless systems are prone to fading and unpredictable noise. Re-transmitting lost packets typically solves such problems in the wireless environment. However, problems such as these are not a concern for optical fiber systems. Physical layer optical systems are very different and operate at much higher rates. Optical systems are not concerned with the re-transmission of traffic, but instead, are concerned with switching to another high speed path as soon as possible. The re-transmission of dropped data packets in optical systems is handled at layers that are higher than those where the claimed invention operates. Therefore no one skilled person would consider the wireless technology of Cleveland when contemplating solving a problem in a physical layer optical transport system.

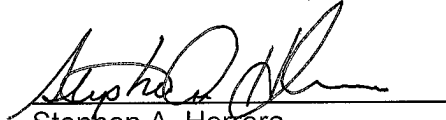
Therefore, neither Nathan nor Cleveland, alone or in combination, teaches or suggests claim 18 or any of its dependent claims. Further, there is no reason to combine the references. As such claim 18 and its dependent claims are all non-obvious over the cited art.

Claims 8-17 and 19-24 stands rejected as being obvious over Nathan in view of Cleveland and Egoshi. Claim 8 is directed to a network system having a plurality of communicatively interconnected transport network elements. Each transport network element comprises an agent that exchanges messages with a remote agent associated with a remote transport network element to control activation and deactivation of the secondary traffic circuit. The messages sent between the two agents are an Activate message, a RevertRequest message, and a Revert message.

As stated above, neither Nathan nor Cleveland, alone or in combination, teaches or suggests these limitations of claim 8. Nor are there any reasons to combine the two. Egoshi does not remedy these deficiencies and the Office Action does not allege that it does. Egoshi is simply cited to support the assertion that the claimed split modules are known. Therefore, for reasons similar to those stated above, none of Nathan, Cleveland, and Egoshi, alone or in combination, teaches or suggests any of claims 8-17 and 19-24.

In light of the foregoing remarks, Applicant respectfully submits that all pending claims are in condition for allowance. As such, Applicant requests that all pending claims be allowed.

Respectfully submitted,
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A handwritten signature in black ink, appearing to read "Stephen A. Herrera", is written over a horizontal line.

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